

## CLAIMS

What is claimed is:

1. A method for screening test compounds for bioactivity, comprising:
  - (a) contacting an array of test compounds with a detector layer; and
  - (b) detecting a detector layer response, wherein a response is indicative of bioactivity.
2. The method of claim 1, wherein the detector layer is comprised of physiologically viable cells.
3. The method of claim 1, wherein the detector layer is scintillant plastic.
4. The method of claim 1, wherein the detector layer is a pH sensing surface.
5. The method of claim 1, wherein the detector layer is a temperature sensing surface.
6. The method of claim 1, wherein the detector layer is supported by an optically clear substrate.
7. The method of claim 6, wherein the detector layer is held stationary in the field of view of the optical detector and the sample surface is moved into contact with said detector layer during the course of measurement.
8. The method of claim 6, wherein the sample surface is held stationary in the field of view of the optical detector and the detector layer is moved into contact with said sample surface during the course of measurement.
9. The method of claim 1, wherein the detection of step (b) is a change in a fluorescence or luminescence property of the cell.

10. The method of claim 9, wherein detection is determined with an illumination system capable of exciting the fluorescence of the detector layer with any of a number of previously selected wavelengths with defined order and of defined time duration.

11. The method of claim 2, wherein the physiologically viable cells form a monolayer.

12. The method of claim 1, wherein the test compounds are generated on a solid support by combinatorial chemistry.

13. The method of claim 1, wherein the test compound array is generated by one- or two-dimensional gel electrophoresis.

14. A method for high throughput screening of test compounds for bioactivity, comprising:  
(a) contacting a solid support comprising an array of multiple test compounds with a detector layer, wherein each test compound comes into contact with a localized liquid which is in contact with the detector layer; and  
(b) detecting a response of the detector layer to the test compound, wherein a response is indicative of a bioactive compound.

15. A method for simultaneously exposing an array of test compounds with a detector layer, comprising the steps of:  
(a) contacting an array of test compounds on a solid substrate with a porous membrane which is in contact with a liquid layer surrounding a detector layer;  
(b) allowing the test compounds to diffuse via the porous membrane to the liquid layer surrounding the detector layer; and  
(c) detecting a response in the detector layer where the detector layer comprises a layer of physiologically viable cells.

16. A method for simultaneously exposing an array of test compounds with a detector

layer, comprising the steps of:

- (a) contacting an array of test compounds held on a porous membrane or non-porous substrate with a liquid layer overlaying a detector layer;
- (b) allowing the test compounds to diffuse from the porous membrane or non-porous substrate into the liquid layer overlaying the detector layer; and
- (c) detecting a response in the detector layer where the detector layer comprises a layer of physiologically viable cells.

17. An apparatus for screening an array of test compounds for bioactivity, comprising:

- (a) a solid support comprising an array of test compounds;
- (b) a porous membrane; and
- (c) a detector layer, wherein a liquid layer is between the porous membrane and detector layer, and wherein the test compounds contact the detector layer by movement via the porous membrane.

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